MURRAY CITY WATER DEPARTMENT

Water Specifications & Requirements

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Table of Contents

Pre Construction

- Prior to installation all extensions, or connections to water mains must be approved in advance by the public services director or designee in accordance with Murray City Code 13.08.190 (Ord. 02-35 § 5).
- Water connection impact fees must be paid prior to new development which includes remodeling, building enlargement, or any other construction or improvement which will place an increased burden on the city water system in accordance with Murray City Code 13.08.050 (Ord. 02-35 § 5).
- Obtain all street cut permits and any other permits applicable to the work being preformed.
- On mainline pipe jobs a pre construction meeting should be set up by the developer. The meeting should include the developer, contractors and Murray City personnel who will be involved in the project. This meeting is generally beneficial for all parties involved.

Construction

- Murray City will be given advance notification of when work is to begin.
- It is unlawful for any person, without authority, to open any valve or other fixture attached to the city waterworks system in accordance with Murray City Code 13.08.040 (Ord. 02-35 § 5).
- Murray City personnel will inspect all work being performed and nothing shall be buried until approved by an authorized inspector. Murray City maps all new construction with a global positioning system (GPS) and if water features are buried before they are documented or inspected you will be asked to uncover them.
- All testing shall be overseen by Murray City personnel, no waterline will be accepted into the system until all tests have been completed. A complete disinfection and testing requirements checklist has been provided in this manual.
- Any time water will be shut off, it is the contractors job to give a minimum of 24 hours advanced notification to all those who will be affected. This notification should include: Contractors name and telephone number, the date the water will be shut off, an approximate time that the water will be shut off and turned back on.

Material Specifications

	**Pipe** Special thickness Class 52 Ductile Iron Pipe (ANSI A21.4/AWWA C151) Pipe size shall be approved by the Murray City Water Department.		**Valve Boxes** Sliding Adjustable type, cast iron, with cast iron cover with the word "WATER" cast into it.
	**Wrap** Polyethylene Encasement (ANSI/AWWA C105/A21.5-99) All piping should be wrapped with AWWA approved polyethylene encasement.		**Fire Hydrants** Mueller A-423 or Super Centurion.
	**Tape** 2" Wide 20 Mill Tape No other type of tape will be allowed.		**Service Line** Type K, soft temper. Copper tubing. Minimum service line for new installations should be 1 inch. Murray City Water Department may require larger line sizes to meet the minimum flow requirements of the user.
	**Fittings** Ductile Iron Cement Lining and Aspaltic seal coat in accordance with (ANSI/AWWA C104/A21.4)		**Service Fittings** Flare Fittings Compression fittings are not allowed under any circumstance.
	**Grease** FM Food Quality Grease Applied to all nuts and bolts		**Corporation Stops** AWWA tapered C.C. threads with flare fittings I.P. threads used with double strap saddles on 1 1/2" and 2" connections, with flare fittings.
	**Ductile Tapping Sleeves** It is Murray City policy to use ductile tapping sleeves on ductile iron mains. However, because of our larger water mains an exception may be considered if it can be demonstrated that efforts have been made, or the timing of a project is critical to keep a roadway open or project on schedule. Specific details will be reviewed on a case by case basis.		**Steel Tapping Sleeves** PowerSeal stainless steel sleeve (model 3490). Wrapped with Canusa Shrink Wrap or a suitable equivalent. **Steel tapping sleeves are only to be used on steel waterlines unless approved by Murray City.**
	**Valves** Gate: Mueller type resilient seat valves or the use of a suitable equivalent with approval by Murray City Water Department before installation.		**Saddles** Double Strap Brass Saddles on 1 1/2" and 2" connections.

Material Specifications (Continued)

	**1" Meter Setters** 1 inch meters must have an 18" copper setter with a ball valve (No Backflow).		**3/4" & 1" Meter Box** Plastic 20X30 Midstates, MS203B or Carson Industries B Series 20X30 H. or Concrete 18X30
	**1 1/2" & 2" Meter Setters** 1 1/2" and 2" meters must have an 18" copper setter. Double valve, inlet and outlet with lockable bypass valve (no backflow).		**1 1/2" & 2" Meter Box** 4X4 Dura Crete box without a floor or a pre approved suitable equivalent. 3" meters and up must be concrete without a floor and have adequate room for service and maintenance.
	**Meter Rings & Lids** Cast iron that fit the appropriate box with holes for the AMR systems.		**Water Meters** Murray City provides water meters based on planned flow (Badger Meters). Note: Murray does not stock larger meters 3 inches and up, if your job requires a larger meter 3" and up please give Murray City two weeks advance notification to make sure it is available when needed.

Note: On meters larger than 2" see sectional drawing page 16 or APWA plan 523 without E & K.

Installation

1) Ductile iron and pipe fittings.
   a) The contractor shall have on the job site with each pipe laying crew, all the proper tools to handle the pipe.
   b) All pipe and fittings shall be thoroughly cleaned before being laid and shall be kept clean until installed.
   c) Pipe should be laid in the dry trench conditions. At no time should water in the trench be allowed to flow into the pipe. At any time that work is not in progress, or the trench is unattended, the end of the pipe shall be suitably closed to prevent the entry of animals, earth, water, etc. using a water tight expandable plug. The expandable plug will always be kept at a close proximity to the end of the pipe incase of an emergency.
   d) Lay pipe and fittings in accordance with the requirements of AWWA C600, except when noted otherwise herein.
   e) Murray City has a minimum depth requirement of 36 inches and prefers pipe to be laid at a depth of 48 inches. Once the excavation has been completed to the proper depth the pipe bed should be prepared as follows.
      (1) Pipe that is to be laid on undisturbed sub grade should be manually excavated around the pipe bells assuring a uniform surface along the pipe barrel. This practice will also assist in applying required tape around the bell.
      (2) Murray City can require that pipe be laid on a bedding material if the native soil is not in ideal condition. The bedding material will be sand with no rocks that could puncture the polyethylene wrap.
   f) Polyethylene encasement should be installed according to AWWA C105/A21.5-99 (See attached Murray City Required Method of Pipe Installation page 11). Care should be taken to not puncture or tear the wrap. All small rips, tears, and other damage should be repaired using 2" wide 20 mill tape.
   g) Jointing shall conform to manufacturer's instructions and appropriate AWWA standards. Apply lubricant to the exposed surface of the gasket and plain end of the pipe in accordance with the pipe manufacturer's recommendations. Lubricant is furnished in sterile containers, and every effort should be made to protect against contamination.
   h) All fitting installations should conform to the manufacturer's instructions.
   i) Install concrete thrust blocks at all fittings and other locations, as directed by Murray City Water Department.
2) Hydrant Installation (Sectional Drawing on page 15).
   a) Hydrants shall be set at the location shown and bedded on a firm foundation. Each hydrant shall be set in true vertical alignment. All nuts and bolts below the finished grade should be given a heavy coat of FM food quality grease. Every thing below the finished grade should be wrapped completely with polyethylene and tapping appropriately. Polyethylene should be cut at the bottom to allow drainage from the drain ports.
   b) Hydrants should be set a minimum of 1 foot from the back of the curb.

c) Concrete thrust blocks shall be placed between the rear of the hydrant inlet and undisturbed soil at the end of the trench. Special care shall be taken so that concrete does not plug the drain port.
d) During backfill pea gravel should be placed around the rear of the hydrant to a point 6 inches above the drain port.
e) No hydrant shall be backfilled until directed by a Murray City Water Department inspector.

3) Valve Installation.
   a) All valves should be set in true vertical alignment.
   b) All nuts and bolts should be given a heavy coat of FM food quality grease.
   c) Valves should be wrapped with polyethylene with only the operating nut exposed. The valve should be tapped in a way to not infringe on the operation of the valve.
   d) Murray City may request that a concrete block be placed underneath each valve and wedged tightly to support the weight and prevent slippage.
   e) Valve boxes of the sliding adjustable type must be centered over the nut or the valve so that a valve key can access the nut and open and close it smoothly. The contractor is also responsible to make sure all valve boxes are clear of dirt and debris and ready for operation.
4) Water Service Installation (Sectional Drawing on page 14).
   a) ¾ and 1 inch taps shall be installed using C.C. corps with flare fittings.
   b) 1 ½ and 2 inch taps shall be installed using I.P. corps with double strap brass saddles.
   c) Install corporation stops in the new water main either at the time of installation or later when the service connections are constructed. Service connections shall not be constructed until after pipe has been disinfected and tested. And for the sake of required pressure testing it is recommended that corporation stops not be installed until testing has been completed.
   d) Corporation stops shall be installed in the pipe at the 10 o'clock or 2 o'clock position. Stops shall be tightened only sufficiently to be watertight.
   e) Install type K copper tubing from the corporation stop to the water meter, or to the existing service if performing a changeover.
   f) Care should be exercised in the placing and laying of copper tubing to be sure that the pipe does not have any kinks and is not installed near any sharp stones that may cause damage to the copper tubing.
   g) Copper must be installed from the water main to the building or residence.
5) Meter Box Instillation.
   a) All meters are to be installed in the park strip or within 5 feet of the property line (street side).
   b) Do not install meter boxes under driveway approaches, sidewalks, in parking lots, or under curb and gutter. Box should be placed in a landscaped area.
   c) The box shall be set so that the grade of the frame and the cover matches the grade of the surrounding surface.

Disinfection & Testing Requirements

Murray City Corporation recognizes the American Water Works Association (AWWA) standard C651-92 is widely accepted and recognized within the water industry as the guide to use for main water line disinfection. However, Murray City has found additional safety measures must be observed to protect the water quality within newly constructed water mains.

For the purpose of main water line disinfection, we recommend using one of the methods described in the AWWA standard C651-92. For ease and safety purposes we recommend using a granular type of hypochlorite. However, any of the disinfection methods given would be adequate.

Once a section of pipe has been completed and is ready to be filled the testing process can begin. At this point the following steps should be taken.

1) Murray City personnel will slowly fill the section of pipe that is to be tested. Contractors are not to operate valves at any time.
2) Once the line has been filled Murray City personnel will take a chlorine residual sample at two different locations. There must be a free chlorine residual greater that 100mg/L to proceed to step 3. If the chlorine residual is less than 100mg/L then steps must be taken to chlorinate the line again before testing can proceed.
3) Now the line must remain static for a minimum of 24 hours to allow the disinfection process to take place.
4) After the minimum 24 hour period Murray City personnel will again take two chlorine residual samples to verify that the free chlorine residual is greater than 100mg/L. If the residual is still greater than 100mg/L then testing can proceed.
5) Now the main can be flushed. While disposing of chlorinated water care must be taken not to pollute the environment in any way.
6) After flushing has been completed Murray City personnel will take a chlorine residual test to make sure the waterline is free from chlorine. If chlorine is present more flushing will be needed. Once the line is chlorine free testing can proceed.
7) Murray City personnel can now take the first bacteriological samples. One sample is required for every 800 feet of being put into service. Sample results take a minimum of 24 hours to receive and sometimes longer based on when the sample is received by the lab. If the sample results are negative you may proceed to step 8, if the sample results are positive then additional flushing will be required along with repeat samples, all repeat samples will be at the expense of the contractor.
8) The pressure test requires that a pressure of 200 psi be maintained for two hours. Special care must be taken during the pressure test not to contaminate the water in the main. All components of the pressure test must be supplied by the contractor.
9) A second set of bacteriological samples can now be taken from the previous sample points used in step 7. If the sample results return negative the water main will be accepted and put into service. Positive results will result in further testing at the contractors' expense.

Murray City Water Fees

Effective November 1, 2002

Residential & Hospital Uses

Single Family Dwelling..... $2,677.00

Multiple Family Dwelling.....No. of Apts._____x $1,472.00= _____

Hotel/Motel.....No. of Rooms_____x $669.00= _____

Rest Homes/Hospitals.....No. of Rooms_____x $937.00= _____

Fees for Accessory other uses from below..... + _____

TOTAL..... _____

Other Uses

Fee for other uses is the **greater** of the following:

User Type*	Occupant Load	EDU
Repair of Service Facility	_____ x	$107.00= _____
Office	_____ x	$85.66= _____
Conventional Restaurant	_____ x	$53.54= _____
Fast Food Restaurant	_____ x	$34.80= _____
Bar and Grill	_____ x	$17.13= _____
Shopping Center	_____ x	$3.75= _____
Indoor Theatre	_____ x	$17.13= _____
Church/Assembly Hall	_____ x	$17.13= _____
Schools with Cafeteria, Gym and Showers	_____ x	$187.39= _____
Laundry (per machine)	_____ x	$3,212.40= _____

TOTAL FEE FOR ALL OTHER USES

*For uses not specifically listed, the Building Official shall classify & determine EDU OR

Water Meter Size:

1” = $2,677.00

1 ½” = $5,355.00

2” = $8,568.00

3” = $16,064.00

4” = $26,744.00

6” = $53,548.00

8” = $85,676.00

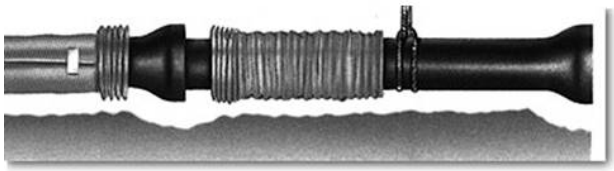
10” = $133,869.00

Other Uses

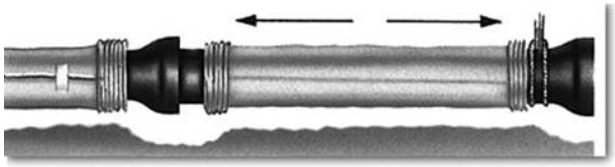
Water Impact Fee..... = _____

Murray City's Required Method of Pipe Installation

STEP 1
Cut a section of polyethylene tube approximately two feet longer than the pipe section. Remove all lumps of clay mud, cinders or other material that might have accumulated on the pipe surface during storage. Slip the poly tube around the pipe, starting at the spigot end. Bunch the tube accordion-fashion on the end of the pipe. Pull back the overhanging end of the tube until it clears the pipe end.

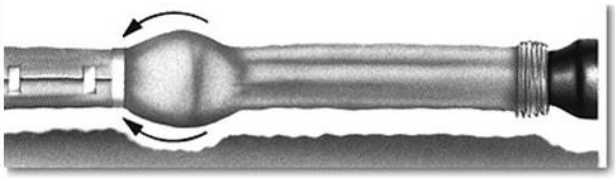


STEP 2
Dig a shallow bell hole in the trench bottom at the joint location to facilitate installation of polyethylene tube. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe.



STEP 3
Move the cable to the bell end of the pipe and lift the pipe slightly to provide enough clearance to easily slide the tube. Spread the tube over the entire barrel of the pipe. Make sure that no dirt or other bedding material becomes trapped between the wrap and the pipe.

STEP 4
Make the overlap of the polyethylene tube by pulling back the bunched polyethylene from the preceding length of pipe and securing it in place. Murray City requires that polyethylene be secured in place using 2" 20 mill tape.

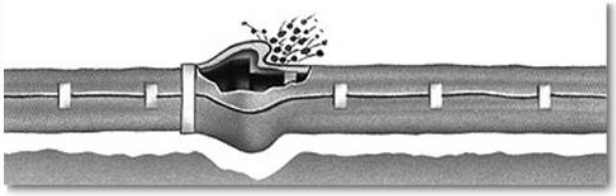


STEP 5
Overlap the secured tube end with the tube end of the new pipe section. Secure the new tube end in place using 2" 20 mill tape.

STEP 6
Take up the slack in the tube along the barrel of the pipe to make a snug, but not tight, fit. Fold excess polyethylene back over the top of the pipe.

STEP 7
Secure the folds every three feet along the pipe barrel using 2" 20 mill tape.

STEP 8
Repair all small rips, tears, or other tube damage with 2" 20 mill tape. If the polyethylene is badly damaged, repair the damaged area with a sheet of polyethylene and seal the edges of the repair with 2" 20 mill tape.



STEP 9
Carefully backfill the pipe according to the AWWA C600 standard for backfill procedure. To prevent damage during backfilling, allow adequate slack in the tube at the joint.

Backflow Prevention Requirements

Whenever Murray Water Department deems a service connection's water usage contributes a sufficient hazard to the water supply, an approved backflow prevention assembly shall be installed on the service line of the identified consumer's water system, at or neat the property line, or immediately inside the building being served; but, in all cases, before the first branch line leading off the service line.

Hydrant Bonnet Color Code

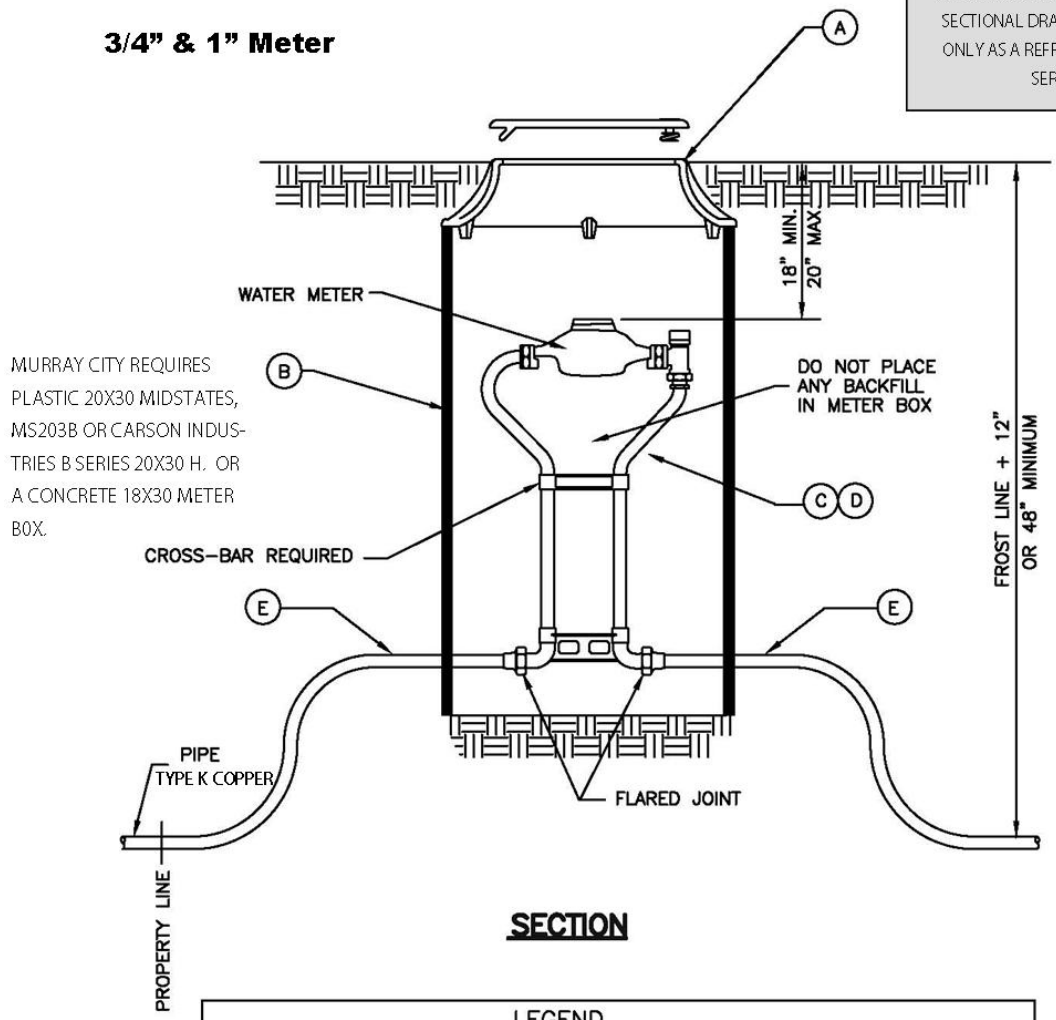
Fire hydrants shall be color coded to coincide with the size of the water main serving the hydrant.

1. 4" and smaller main..... White
2. 6" main..... Red
3. 8" and 10" main..... Orange
4. 12" or larger main..... Green

Sectional Drawing A

MURRAY CITY REQUIRES THAT ALL NEW SERVICES BE A MINIMUM OF 1". THIS SECTIONAL DRAWING SHOWS 3/4" ONLY AS A REFRENCE TO EXISTING SERVICES.

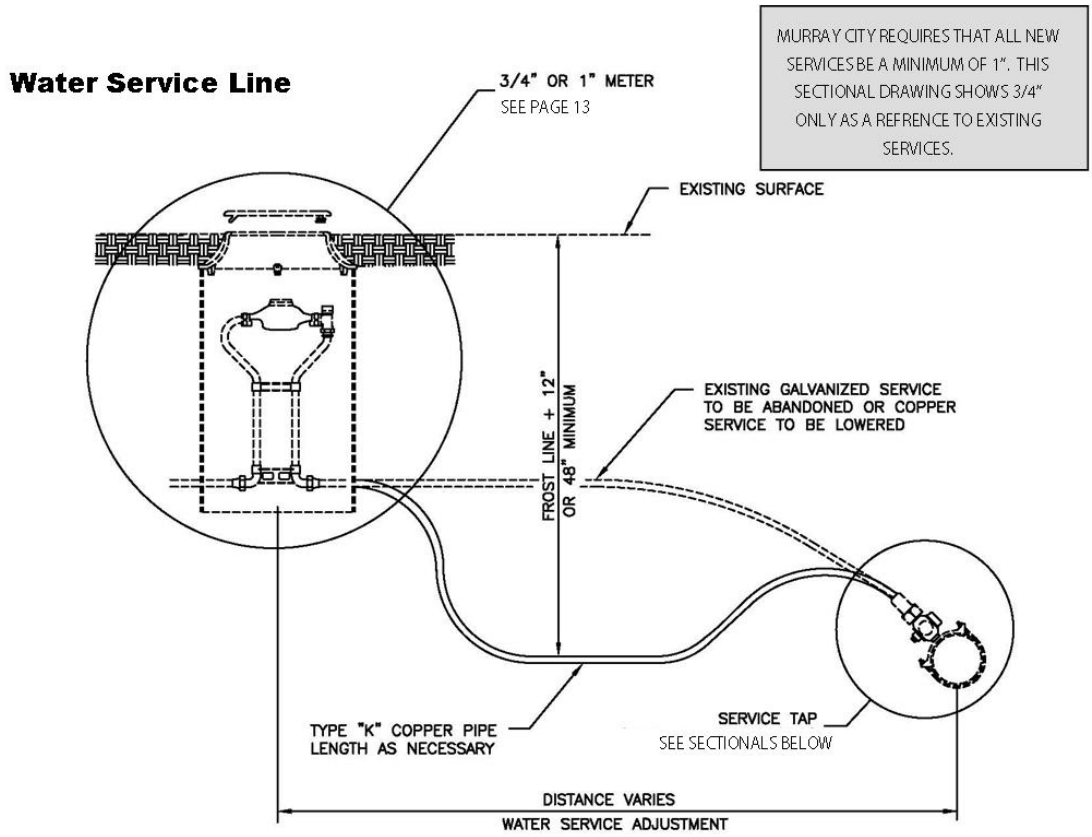
3/4" & 1" Meter



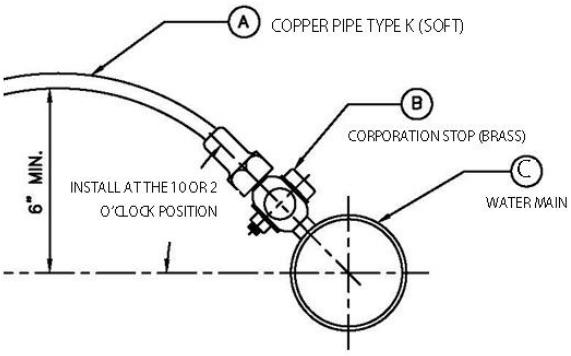
SECTION

LEGEND			
No.	*	ITEM	DESCRIPTION
A		FRAME AND COVER	CAST IRON WITH HOLES FOR AMR SYSTEMS
B		METER BOX	SEE MATERIAL SPECIFICATIONS (PAGE 6)
C		3/4" METER YOKE	18 COPPER SETTER WITH BALL VALVE (NO BACKFLOW)
D		1" METER YOKE	18 COPPER SETTER WITH BALL VALVE (NO BACKFLOW)
E		COPPER PIPE	TYPE K (SOFT)

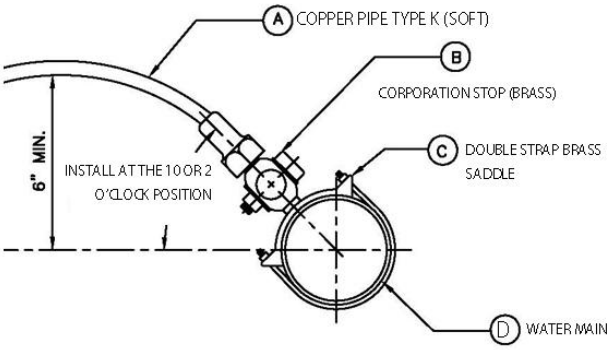
Sectional Drawing B



Service Taps



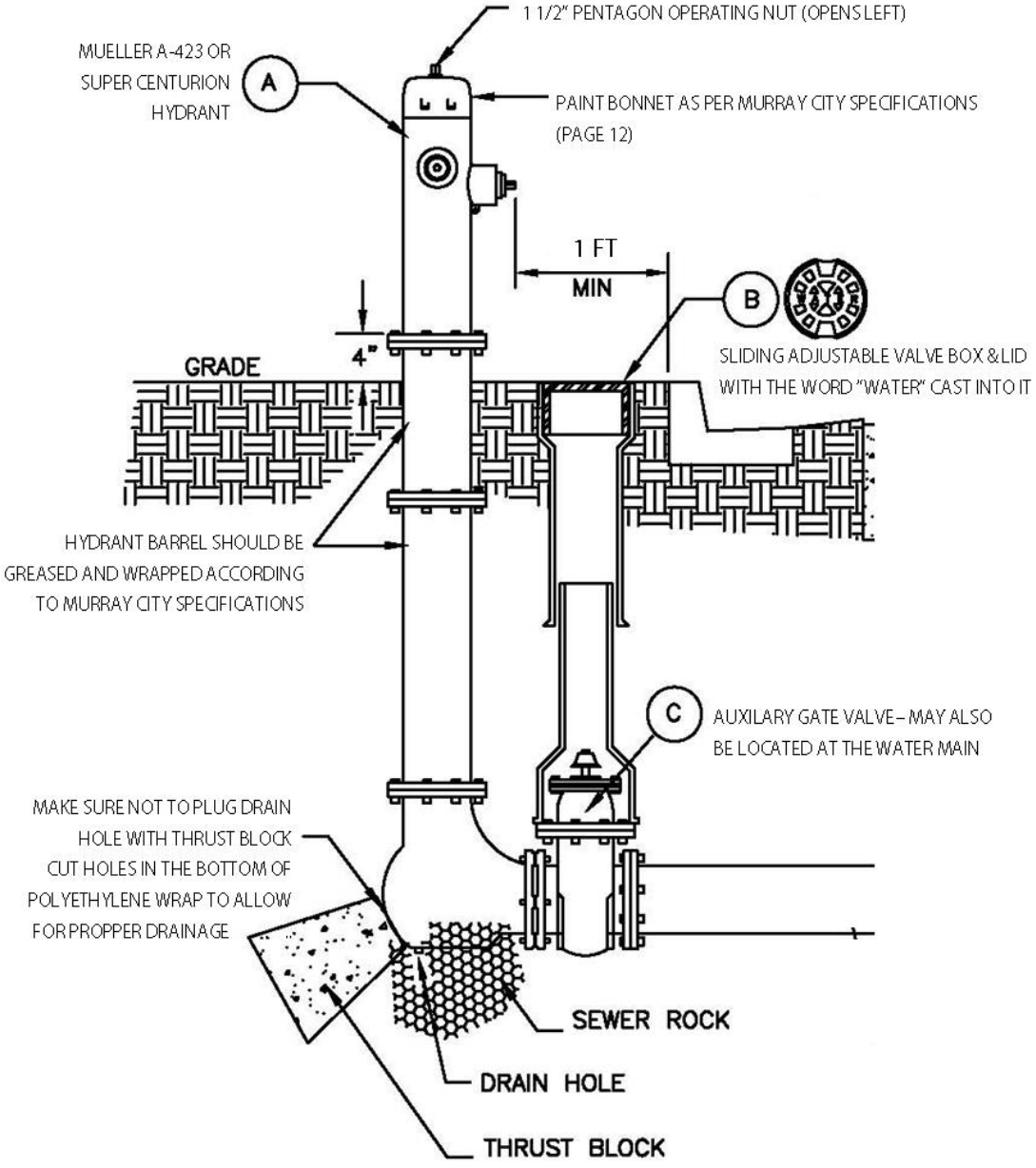
DIRECT TAP– 3/4" & 1" SERVICE TAPS



SADDLE CLAMP - 1 1/2" & 2" SERVICE TAPS

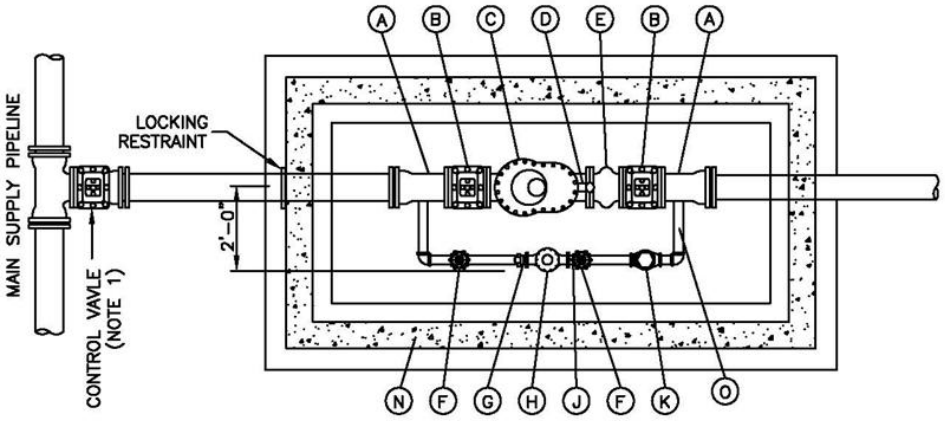
Sectional Drawing C

Fire Hydrant with Valve

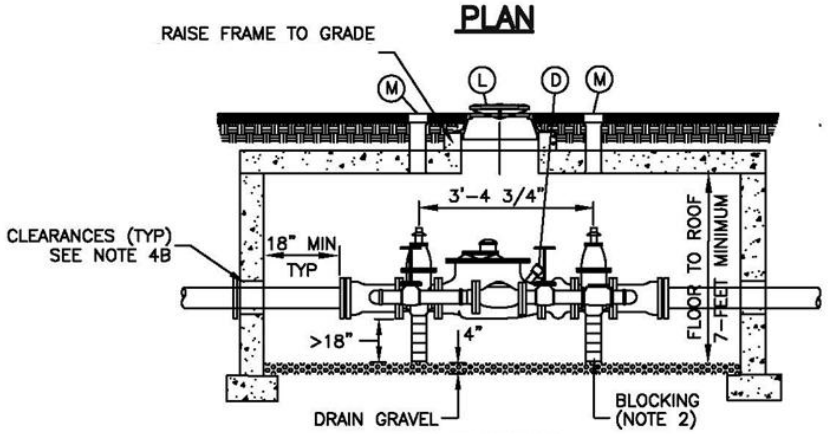


Sectional Drawing D

Meters Larger than 2”



PLAN



ELEVATION

LEGEND			
No.	*	ITEM	DESCRIPTION
A		3" OR 4" FLANGE x M.J. ADAPTER	
B		3" OR 4" GATE VALVE WITH 2"x2" OPERATING NUT	
C		3" OR 4" COMPOUND METER	
D		2" TEST ASSEMBLY	
~~E~~		~~3" OR 4" CHECK VALVE~~	NOT REQUIRED
F		2" GATE VALVE	
G		2" METER FLANGE	
H		2" DISPLACEMENT METER	
J		2" MALE METER FLANGE	
~~K~~		~~2" CHECK VALVE~~	NOT REQUIRED
L		27" FRAME AND COVER	
M		TOP SECTION OF VALVE BOX WITH LID	
N		CONCRETE BOX	
O		COPPER PIPING	